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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/530,934	05/05/2000	KLAUS HUBER	2345/129	5127

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EXAMINER

TRAN, KHANH C

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 09/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/530,934

Applicant(s)

HUBER, KLAUS

Examiner

Khanh Tran

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 16-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-28,30 and 31 is/are rejected.
- 7) ☒ Claim(s) 29 and 32 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All   b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 16-28, 30-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Calderbank et al. U.S. Patent 5,115,453.

Regarding claim 16, Calderbank et al. invention is directed to a communication system that utilizes a multi-dimensional signaling scheme. As well known in the art, multi-dimensional scheme inherently employs orthogonal basis function to minimize interference between channels. Figure 1 illustrates a transmitter in a data communications system wherein signal points in the signal constellation are selected to represent incoming data. The signal constellation is divided so that each one of the regions includes an equal number of signal points. The selection of the signal points is in accordance with a pre-determined signal point probability distribution in which the selection of signal points within any one region is equally probable and the probability of selecting any signal point in one region is different from that in another region. Advantageously, by choosing the probability distribution in the foregoing manner, the shape gain of the signal constellation is substantially increased while minimizing the ratio of the maximum signal power to the average signal power (PAR). As well known,

the transmit power of signal points is limited by the designated maximum power limit, hence, each signal point has a respective defined energy as claimed.

Regarding claim 17, as recited in claim 16, multi-dimensional scheme inherently employs orthogonal basis function to minimize interference between channels. Hence, the source coder 111 employs an orthogonal basis function in the coding process for adapting a data sequence.

Regarding claim 18, Huffman coding is well known in the art and is described in numerous communications textbooks; therefore, employing Huffman method in the source coding would be inherent.

Regarding claim 19, in addition to the rejection argument of claim 17, referring to figure 1, the transmitter 10 includes a Trellis encoder 118. The Trellis encoder 118 introduces redundancy to allow the use of maximum likelihood decoding technique. Hence, Trellis encoder 118 includes error-correcting code adapted for the modulation process. Furthermore, a channel encoder 132 maps the ensemble of signal points into four corresponding pairs of in-phase and quadrature-phase amplitudes. Output of the channel coder is applied to modulator 141. The channel encoder acts as claimed second data source to perform channel-encoding data bits before transmission through the channel.

Regarding claims 22-23, selection of codes for block code are just design choice.

Regarding claim 24, referring to figure 1, the transmitter 10 includes a scrambler 104 to scramble data bits. Hence, it is similar to encrypting input data stream as claimed.

Regarding claim 25, selection of first data rate for the transmission channel greater than a second data rate of the data stream is just a design choice.

Regarding claim 26, as well known in the art, synchronization between the transmitter and receiver is established before actual transmission. Hence, synchronization is performed when no data bits are present in the signal at initialization.

Regarding claim 27, as well known in the art, signaling procedure between the transmitter and receiver is performed at the beginning before actual data transmission. The transmitter would inherently transmit housekeeping data and user data during signaling procedure.

Regarding claim 28, in addition to the rejection argument of claim 16, figure 1 illustrates a transmitter 10 including a data source 101, a source coder 111 that is similar to the claimed recoder, a modulator 141, and a transmission channel 15. Figure 3 illustrates a receiver 30 includes an Viterbi decoder 331, a source decoder 350 that is similar to the claimed inverse recoder, and a data sink 371.

Regarding claim 30, the output of the modulator 141 is inherently buffered before transmission.

Regarding claim 31, buffering inherently stores data in a temporary register, also called a buffer.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calderbank et al. U.S. Patent 5,115,453.

Regarding claims 20-21, block code and convolution code are, well known in the art, utilized for error-correcting code, therefore, it would have been obvious for one of ordinary in the art to modify Calderbank et al. teachings to include either a block code and or a convolution code for error-correcting code.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 22-23 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for "Gaussian integers modulo a Gaussian number" and "Eisenstein-Jacobi integers modulo an Eisenstein-Jacobi, does not reasonably provide enablement for a block code including a code over the claimed features. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. The specification does not disclose the claimed features "Gaussian integers modulo a Gaussian number" and "Eisenstein-Jacobi integers modulo an

Eisenstein-Jacobi" in such a way for a person skilled in the art to utilize them in the claimed application.

***Allowable Subject Matter***

4. Claims 29 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

5. The prior art made of record and not relied upon could be considered pertinent to applicant's disclosure:

Eyuboglu et al. U.S. Patent 6,198,776 B1 discloses "Device and Method for Precoding Data Signals for PCM transmission".

Alouini et al. U.S. Patent 6,304,593 discloses "Adaptive Modulation Scheme with Simultaneous Voice and Data Transmission".

Decker et al. U.S. Patent 4,980,897 discloses "Multi-channel Trellis Encoder/Decoder".

Needham et al. U.S. Patent 5,764,699 discloses "Method and Apparatus for Providing Adaptive Modulation in a Radio Communication System".


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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 703-305-2384. The examiner can normally be reached on Tuesday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 703-306-3034. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3800.

KCT

  
MOHAMMAD H. GHAYOUR  
PRIMARY EXAMINER